

REMARKS

Claim 1 remains in this application.

Claims 1, 4, and 6 stand rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Rohner EP '982; and claim 5 further in view of Sekiyama '124. These rejections are respectfully traversed for the following reasons.

The differences of the cited references contrasted to amended claim 1 are as follows:

1) The present invention is directed to a linear motor having a plurality of permanent magnets assembled with a shaft which can impart linear motion and a rotary motion.

The rotor 20 the present application is formed to be coaxial with first, second and third shafts 21, 22, 23.

The first permanent magnet 21a is a ring-type and the second permanent magnet 23a is arranged on the outer circumferential surface of the third shaft 23 in a vertical direction in the rotation movement zone.

The first permanent magnet and the second permanent magnet are separately constructed on the outer circumferential surface of the shaft to be assembled, so that the linear movement of the linear motor can be precisely controlled when the linear motor is linearly moved, and the permanent magnet to be assembled at the rotation movement zone.

2) U.S. Patent No. Sekiyama '124:

The cited reference, Sekiyama '124, discloses an improved linear motor which is capable of producing a larger thrust in a particular section than thrust produced during normal linear travel.

Sekiyama '124 includes a moving member, a stator, a field pole and an armature section. The moving member of Sekiyama '124 is caused to move relative to the stator, by exciting the armature windings to produce a linearly moving magnetic field. Due to a tapered configuration, magnetic attraction produced between the moving member and the armature core is partly split in the traveling direction, which leads to an increased thrust.

The armature cores 1A and 1B of Sekiyama '124 are slanted at a predetermined angle.

However, the present invention has different armature cores having a regular type shaft, That is, the present invention is able to reduce the total size of the motor.

3) Rohner EP '982:

The cited reference, Rohner '982, is directed to an electromagnetic linear engine including a hole cylinder stator and a rod type rotor.

In Rohner '982, the rod type permanent magnet is located at the region 32 of the rotor 3 and the rotor 3 is able to rotate in direction R of the arrow.

The rotor 3 of Rohner '982 is provided with a single pole type as shown in Figs. 1 and 2, but the permanent magnet 23 of the present invention is provided with a multiple pole type.

Therefore, Rohner '982 has a different construction from the present invention. Also, Rohner '982 is not as easy to control the rotor compared to the present invention. Further, the linear motor of the present invention can be precisely control at a predetermined mode.

Also, the rotor 3 of Rohner '982 includes an inner tube 34 and an outer tube 35, as shown in Fig 4. The permanent component elements 30c between the inner and the outer tubes 34,35 are formed to be coaxial with the shaft.

However, the first permanent magnet of the present invention is a ring-type to be assembled, so that the controlling of the linear movement of the linear motor, which is moved rotatably and linearly, can be improved.

Therefore, APA, Rohner '982, and Sekiyama '124, taken either singly or in combination, do not teach the motor structure of amended claim 1.

Accordingly, in view of the above amendments and remarks, reconsideration of the rejection and allowance of all of the claims of the present application are respectfully requested.

Conclusion

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Mr. Joseph A. Kolasch (Reg. No. 22,463) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

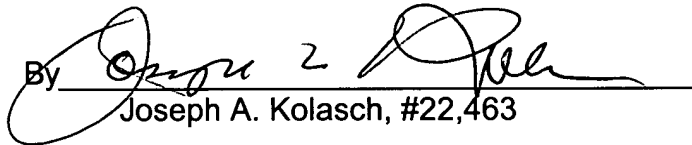
Pursuant to the provisions of 37 C.F.R. 1.17 and 1.136(a), the Applicant hereby petitions for an extension of three (3) months to July 2, 2003 for the period in which to file a

response to the Office Action dated January 2, 2003. A check for the required extension fee of \$930.00 is enclosed herewith.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By 
Joseph A. Kolasch, #22,463

JAK/ALB:bb

P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000